SUBJECT INDEX

A

Abu Dhabi
  natural gas exports of, 474
  natural gas trade partnerships of, 467-68
Acetylene
  amorphous silicon alloy formation and, 11
Addis Ababa, Ethiopia
  energy policy in, 130
Advanced Boiling Water Reactor, 440-41
Advanced Pressurized Water Reactor, 437-39
Afghanistan
  natural gas exports of, 474
  natural gas production in, 465-66
  natural gas production/consumption in, 466-67
  natural gas reserves in, 464-65
  natural gas trade partnerships of, 467-68
Africa
  biomass energy resources in, 408
  cooking fuels used in, 115
  deforestation in, 407, 422
  forest resources in, 409
  fuelwood consumption in, 411
  reforestation in, 424
  urbanization in, 109
African Rift Valley
  methane in, 69
Aggregate demand
  price elasticity of, 335-38
Agricultural chemicals
  production of
    fuel consumption in, 187
Agriculture
  commercial energy and, 217
  industrial energy and, 641
  mobile engines in, 173
Air conditioning
  international penetration of, 396
  residential energy use and, 367
Alcohol fuels
  see Ethanol fuels
Aldehyde pollution
  ethanol fuels and, 156-57
Aluminum
  electrolysis of
    efficiency improvements in, 176
Aluminum industry
  electricity consumption in, 176
American Council for an Energy-Efficient Economy, 311
American Society of Heating, Air Conditioning, and Refrigeration Engineers, 578-79
American Society of Mechanical Engineers Pressure Vessel Code, 443
Ammonia
  amorphous silicon alloy formation and, 10
  production of
    fuel consumption in, 184-85
Amorphous semiconductors
  doping of, 3
  forbidden energy gap of, 7
Amorphous silicon
  carrier transport mechanism of, 8
  deposition of, 8-12
  device structures, 12-17
  hydrogenated, 2-3
  optical absorption coefficient of, 5
  substitutional doping of, 8
Amorphous silicon films
  photoconductivity of, 2
Amorphous silicon hydride
  optical properties of, 3
Amorphous silicon: hydrogen absorption curve
  factors influencing, 6
Amorphous silicon: hydrogen solar cells
  performance of, 16
Amorphous silicon solar cells, 1-31
  collection efficiencies for, 23
  current-voltage characteristics of, 20-21
  device characteristics of, 17-26
  heterojunction, 14-15
  optical absorption properties of, 3-6
  photogenerated carrier transport in, 6-8
  p-i-n type, 14-15
  spectral response of, 21-24
  stacked junction, 15-17
  voltage-dependent current collection in, 24-26
Amorphous silicon solar cell technology
  advantages of, 2
  economic factors in, 26-28
  United States policy and, 29-30
  worldwide efforts in, 28-29
Anadarko Basin
  deep domains of
    gas abundance in, 71
Andaman Islands
  oil fields of, 69
Angola
  petroleum exploration in, 220-22
    contractual agreements governing, 230
  political risk and, 236
  petroleum resource base of, 223
Animal dung
  use as fuel, 420
Appliances
  see Electric appliances
Arab oil embargo, 520, 558, 565-67, 592
ARCO Solar 6.5 MW Carrisa Plains project
  estimated cost of, 27-28
ARCO Solar thin-film silicon solar cell
  current-voltage characteristics of, 21
  quantum efficiency of, 22, 25
  spectral response of, 25
Argentina
  petroleum exploration in, 220-22
    contractual agreements governing, 230
  petroleum resource base of, 222-24
Argon
  presence in gas fields, 70
Argonne National Laboratory, 457
Arizona
  oil and gas fields of
    helium occurrence in, 70
Arizona Public Service Company, 439
ASDEX-U tokamak, 86, 89
ASEA/ATOM, 445-50
Asia
  biomass energy resources in, 408

forest resources in, 409
fuelwood consumption in, 411
liquefied natural gas chains in, 489-91
natural gas supply and demand in, 463-88
Asteroids
surfaces of
hydrocarbons on, 57
Atomic Energy Commission (AEC), 431, 458, 562, 567, 581
Atomic Industrial Forum (AIF), 253, 261
Australia
energy reserve programs of, 528
international fusion research and, 84
natural gas exports of, 477
natural gas production in, 465-66
natural gas production/consumption in, 466-67
natural gas reserves in, 464-65
Austria
energy reserve programs of, 528
Automobile fuel economy
improvement in, 173, 650-53
standards in, 576-77
Automobile ownership
in less developed countries, 124-25

B

Babcock and Wilson, 275
Bahrain
petroleum exploration in
contractual agreements governing, 230
petroleum resource base of, 223
Bangladesh
fuelwood consumption in, 411
natural gas production in, 465-66
natural gas reserves in, 464-65
petroleum exploration in, 220-21
contractual agreements governing, 230
taxation of, 234
petroleum resource base of, 223
Barbados
petroleum exploration in, 221
contractual agreements governing, 230
petroleum resource base of, 223
Belgium
energy reserve programs of, 528
natural gas consumption in, 398
Belize
petroleum exploration in, 221
contractual agreements governing, 230
petroleum resource base of, 223
Benin
petroleum exploration in, 221
contractual agreements governing, 230
petroleum resource base of, 223
Biological markers
in petroleum, 61-62
Biomass fuels, 420
energy productivity improvement and, 657-58
future demand for, 680-81
Biotechnology
process innovation and, 654
Boilers
efficiency improvements in, 174
Boiling water reactors, 252, 261, 266, 267
core melt probabilities for, 435, 440-41
safety features of, 443
Bolivia
petroleum exploration in, 221
contractual agreements governing, 230
petroleum resource base of, 223
Bombay, India
cooking fuels used in, 116
electricity use in, 121-22
Bonneville Power Administration, 561
Bottom-up approach
international residential energy use and, 342-50
Brazil
charcoal production in, 420
ethanol fuels in, 130, 135-62
food vs fuel production in, 137-40
land utilization in, 137-39
per capita gross domestic product growth in, 666
petroleum exploration in, 220
contractual agreements governing, 230
petroleum resource base of, 222-24
Breeder reactors, 603-9
British Petroleum, 473-74, 478
Brookhaven National Laboratory (BNL), 209
Brunei
natural gas exports of, 474
natural gas production in, 465-66
natural gas production/consumption in, 466-67
natural gas reserves in, 464-65
natural gas trade partnerships of, 467-68
Brunei Coldgas, 474
Building Energy Performance Standard, 207, 577-79
Building Performance Index (BPI), 206-8
Burkina Faso
fuelwood consumption in, 411
Burma
natural gas production in, 465-66
natural gas reserves in, 464-65
natural gas self-sufficiency of, 472-73
oil fields of, 68-69
Business Environment Risk Information Index, 236

C

California
Residential Conservation Service in, 297-304, 308-11
California Asiatic Oil Co., 477
California Energy Commission, 300, 303, 568
California Public Utility Commission, 300
Callaway Standardized Nuclear Unit Power Plant System, 437
Calvert Cliffs nuclear power plant
core melt probability in, 433
Cameroon
petroleum exploration in, 220-21
contractual agreements governing, 230
petroleum resource base of, 222-23
Canada
cooking fuel choices in, 366
degree-days in, 354
district heating in, 355
electric heating in, 398
electricity use for lighting in, 367
energy reserve programs of, 528
fuel shares in, 372-73
heat demand in, 351
insulation in, 361

international fusion research and, 84-85
natural gas exports of, 479-80
oil stock consumption ratios for, 526-28
residential energy use in, 392
residential wood use in, 346
space heating fuel choices in, 356
wood consumption in, 358, 399
Canada LNG Corporation, 480
CAN-DECON, 271
CANDU-pressurized heavy water reactor, 441-43
Carbon
abundance in solar system, 57
in meteorites, 57
Carbon dioxide
atmospheric
carbonate rock formation and, 54
fossil fuels and, 677-78
in solar system, 57-58
Carbon isotopes
in carbonaceous material, 62-63
progressive fractionation of, 73-75
Carbon monoxide pollution
ethanol fuels and, 156-57
Carbonaceous chondrites
carbon in, 57
molecular fossils in, 61
Carbonate rocks
formation of, 54
Carbonates
overlying oil and gas fields, 74-75
Caribbean
charcoal-making in, 416
deforestation in, 407
Cement
energy productivity improvement and, 655-56
Central America
deforestation in, 407, 422
forest resources in, 409
Central heating
international penetration of, 360, 380-82, 394-95
Centre Européen pour Recherche Nucléaire, 100
Charcoal
commercial uses of, 419-20
consumption in developing countries, 407, 414-20
domestic use of, 419
production of, 415-17
transportation of, 417-18
Chase Manhattan Bank, 576
Chemical industry
electricity consumption in, 176
process innovation and, 654
Chemical vapor deposition
amorphous silicon alloy deposition and, 8-10
Chemical vapor deposition reactors
schematics of, 12
Chile
petroleum exploration in, 221
contractual agreements governing, 230
petroleum resource base of, 223
China
see People's Republic of China,
Chinese Petroleum Corporation, 483
Chrysler Corporation
automobile fuel economy standards and, 577
Chubu Electric, 480
C. Itoh, 476, 478
Civil defense
nuclear power plants and, 508-9
Climate
global energy strategy and, 619
residential energy use and, 350-51
Clinch River Breeder Reactor, 582, 606
Coal
constrained annual production of, 679
electricity production in United States and, 565
industrial use of, 177-78
residential energy use and, 399
Coal mining
mobile engines in, 173
Coal products
production of
fuel consumption in, 189-93
Cogeneration, 174
pulp and paper industry and, 181
Coke
industrial use of, 177-78
residential energy use and, 399
Colombia
energy policy in, 129
petroleum exploration in, 220-22
contractual agreements governing, 230
petroleum resource base of, 223
Colorado
oil and gas fields of
helium occurrence in, 70
Combustion Engineering, Inc., 275, 439
Combustion System-80, 439-40
Commercial and Apartment Conservation Service Program, 290
Commercial buildings
energy productivity improvement in, 649-50
Commercial energy
demand of less developed countries for, 217
Commodity prices
inflation and, 319
Compagnie Francaise de Petroles, 474, 478
Computer-assisted design
process innovation and, 654
Computer-assisted manufacturing
process innovation and, 654
Congo
petroleum exploration in, 221
contractual agreements governing, 230
petroleum resource base of, 223
Conservation
passive solar systems vs, 211-12
Consumer prices
oil shocks and, 331-32
Contractual agreements
petroleum exploration and, 228-31
Convection
in passive solar buildings, 210
Cooking
ethanol used for, 156
in less developed countries, 112-18
residential energy use and, 365-67
Cooking fuels
in less developed countries, 113-17
Core melt probability (CMP), 433-35
boiling water reactors and, 440-41
Corn cultivation
mobile engines in, 173
Council for Mutual Economic Assistance (CMEA), 661-62
Crude Oil Windfall Profit Tax Act of 1980, 586
Cummins Engine Company, 651

D

DECON, 253-55, 262
decommissioning activities for, 270

Deep level transient spectroscopy (DLTS)
amorphous silicon doping and, 8
Deforestation, 407-8
environmental impact of, 422-23
global energy strategy and, 619-20
Dehumidifiers
passive cooling and, 211
Delivered energy, 347
Denmark
appliance efficiencies in, 388
cooking fuel choices in, 366
degree-days in, 354
district heating in, 355, 372
electric heating in, 398
electricity use for lighting in, 367
energy research and development expenditures in, 600
energy reserve programs of, 528
energy use per dwelling in, 382, 387
hot water energy consumption in, 364-65
housing stock turnover in, 394
oil-heating stock consumption in, 363
residential energy use in, 392
secondary fuels in, 358
small appliances in, 366
space heating fuel choices in, 356
useful energy consumption in, 387
wood consumption in, 399
Denuclearization, 682
Desertification
global energy strategy and, 619-20
Diamond
depth required to produce, 60
Diborane
amorphous silicon doping and, 8
amorphous silicon : hydrogen optical absorption and, 6
Diesel engines
efficiency improvements in, 173
ethanol fuels and, 155-56
Dimethylsilane
amorphous silicon alloy formation and, 11
Direct gain solar systems, 202
Direct process heat
industrial fuels and, 171-73
District heating, 355, 372, 386
Dome Petroleum, 479
Dominican Republic
petroleum exploration in, 221
contractual agreements governing, 230
petroleum resource base of, 223
Doublet III tokamak experiment, 82, 88
Dresden-1 nuclear power plant, 251
Drift collection
amorphous silicon and, 8
Duquesne Light Company, 268

E

Earth
formation of, 56
hydrocarbons at depth in, 58-60
Earth's crust
fluid ascent through, 63-65
Earth's mantle
chemical composition of, 56
East Pacific Rise
methane emitted from, 69
Econometrics
petroleum exploration in less developed countries and, 238-46
Economic crisis
global energy strategy and, 614-16
Edison Electric Insitute (EEI), 253, 288
Egypt
nuclear power plant siting in, 510
nuclear power plants in, 502-3
petroleum exploration in, 220-22
contractual agreements governing, 230
taxation of, 234
petroleum resource base of, 222-24
ELAK, 395
Electric appliances
increasing efficiencies in, 388
international penetration of, 381-83, 395
residential energy use and, 367-70
use in less developed countries, 120
Electric Power Research Institute (EPRI), 45, 275, 607
Electricity
cooking and, 115
future demand for, 676-77
industrial lighting and cooling and, 171
industrial use of, 175-77
lighting and, 367
machine drive and, 173
nuclear production of, 37
photovoltaic conversion of sunlight into, 1
preembargo United States energy policy and, 561-62
prices of
regulation of, 571
pulp and paper industry and, 181
steel industry and, 172-73
Electrolysis
industrial fuels and, 174
Electron spin resonance (ESR)
amorphous silicon doping and, 8
Electronic equipment
home use of
electricity use and, 396-97
Electropolishing
radioisotope decontamination and, 271
Elk River nuclear power plant, 255, 258
dismantling of, 275
Elred, 654
Emergency Petroleum Allocation Act of 1973, 585
Employment generation
energy and, 638
Energy
development and, 638-40
Energy balance
components of, 204
Energy conservation, 575-80
Energy Conservation and Production Act of 1976, 585
Energy conversion technology
energy productivity improvement and, 656
Energy Coordinating Group, 596
Energy demand
model for, 668-74
Energy Modeling Forum (EMF), 318, 325-33
Energy Policy and Conservation Act of 1975, 523, 585
Energy prices
energy use and, 371
macroeconomic effects of, 318
oil shocks and, 333-34
Energy Reorganization Act of 1974, 567
Energy Research Advisory Board, 603
Energy research and development
international, 589-611
United States, 580-83
Energy Security Act of 1980, 286, 288, 523
Energy strategy
see Global energy strategy

Energy supply
global scenario for, 674-81
Energy Supply and Coordination Act of 1974, 585
Energy Tax Act of 1978, 586
Energy Technology Policy Study, 603
Energy use
income elasticity of, 371
in less developed countries, 109-32
see also Residential energy use
Ente Nazionale Idrocarburi, 549
ENTOMB, 254, 281
Erdolbevorratungsverband, 547
Ethane
abundance in solar system, 57
Ethanol fuels
Brazil and, 130, 135-62
cooking and, 156
cost comparison with gasoline, 144-45
diesel engines and, 155-56
environmental impact of, 156-57
Otto cycle engines and, 154-55
production of
costs of, 141-46
employment and, 146-49
energy balance and, 149-51
government policy and, 157-60
technological developments in, 151-57
Ethiopia
charcoal-making in, 416
energy policy in, 130
petroleum exploration in, 221
contractual agreements governing, 230
petroleum resource base of, 223
Ethylene
production of
fuel consumption in, 185-86
European Community
electric appliance ownership growth in, 395
energy research and development in, 592-94
forest resources in, 409
hot water energy consumption in, 365
international fusion research and, 84-104
nuclear power in
strategic implications of, 504-6
European Economic Community, 526
European Insulation Association, 361
Excess capacity
aggregate price levels and, 334-35
inflation and, 320-21
Expectations
inflation and, 321-22
Exxon
political risk assessment procedures of, 237

F

Far East
deforestation in, 407
Federal Energy Administration, 523, 567
Federal Energy Office, 567
Federal Energy Reliability Council (FERC), 279
Federal Nonnuclear Energy Research and Development Act of 1974, 585
Federal Power Commission, 562, 567
Federal Republic of Germany
appliance efficiencies in, 388
cooking fuel choices in, 366
degree-days in, 354
district heating in, 355, 372
electric heating in, 398
electricity use for lighting in, 367
energy research and development expenditures in, 600
energy reserve programs of, 528
energy use per dwelling in, 382, 392
heating equipment saturation in, 394
house vintage in, 361
housing stock turnover in, 394
international fusion research and, 85, 88, 105
natural gas consumption in, 397-98
oil stock consumption ratios for, 526-28
petroleum stockpiling in, 546-47
plasma technology and, 100
residential energy use in, 377-79
small appliances in, 366
space heating fuel choices in, 357
Federal Trade Commission (FTC), 288
Firewood
use as cooking fuel, 113-16
Food and Agriculture Association, 617
Food scarcity
global energy strategy and, 617
Ford Foundation Energy Policy Project, 563-64
Ford Motor Company
automobile fuel economy standards and, 576
Fossil fuels
atmospheric carbon dioxide and, 677-78
dependence of less developed countries on, 217
Fowlkes Engineering, 209
France
cooking fuel choices in, 366
degree-days in, 354
district heating in, 355, 372
electric heating in, 358, 398
electricity use for lighting in, 367
energy reserve programs of, 528
energy use per dwelling in, 382, 392
international fusion research and, 85, 94, 105-6
natural gas consumption in, 397
oil stock consumption ratios for, 526-28
petroleum stockpiling in, 549
residential energy use in, 348-49
secondary fuels in, 358
space heating fuel choices in, 356
Super-Phenix project of, 94, 106
useful energy consumption in, 387
wood use in, 358
FRED, 275
Fuels
see specific types
Fuelwoods
commercial uses of, 413-14
consumption in developing countries, 407
domestic consumption of, 410-12, 425
energy productivity improvement and, 657-58
environmental impact of, 422-23
resource base of, 424-25
shortages in, 613-14
see also Wood fuels
Fusion Experimental Reactor, 82-83
Fusion Materials Irradiation Test, 86-87, 102

G

Gambia
fuelwood consumption in, 411
Garigliano nuclear power plant, 251
Gas
see Natural gas
Gasoline
cost comparison with ethanol, 144-45
ethanol as substitute for, 135
price of
oil shocks and, 331
General Electric Company, 261, 269, 440, 456-57
General Motors
automobile fuel economy standards and, 576
Germane
amorphous silicon alloy formation and, 10
Germany
see Federal Republic of Germany
Ghana
petroleum exploration in, 221
contractual agreements governing, 230
petroleum resource base of, 222-23
Global energy strategy, 613-84
energy demand and, 637-45, 660-74
energy productivity improvement and, 645-58
energy supply and, 674-81
implementation of, 681-82
studies of, 620-37
Glow discharge
amorphous silicon alloy deposition and, 8-9
Granitic rock
methane in, 60
Greece
energy research and development expenditures in, 600
energy reserve programs of, 528
Gross national product (GNP)
1973-1975, 323-24
energy demand and, 627-28
price deflator for, 323-32
Guatemala
petroleum exploration in, 221
contractual agreements governing, 230
petroleum resource base of, 223
Gundremmingen A nuclear power plant, 251
decommissioning of, 266-68
Guyana
petroleum exploration in, 221
contractual agreements governing, 230
petroleum resource base of, 223

H

Heating oil
home consumption of, natural gas and, 397
price of
oil shocks and, 331
Helium
concentration in petroliferous areas, 69-70
Heterojunction solar cells, 14-15
High Flux Isotope Reactor (HFIR), 87
High-temperature gas-cooled reactor (HTGR), 443-44
modular, 450-54
cross section of, 452
Hitachi, 440
Home computers
electricity consumption and, 396-97
Home energy use
in less developed countries, 111-23
Honduras
petroleum exploration in, 221
contractual agreements governing, 230
petroleum resource base of, 223
Hong Kong
commercial/institutional energy use in, 127-28
electricity use in, 121-22
household energy use in, 126
natural gas imports of, 480, 484-85
patterns of energy use in, 111
transportation energy efficiency in, 125
Hong Kong and China Gas Company, 480
Hot water
residential energy use and, 364-65
Household energy
space heating and, 350-64
Humboldt Bay-3 nuclear power plant, 251
Hyderabad, India
cooking device efficiency in, 117
cooking fuels used in, 114-18
Hydrocarbon deposits
biological origins of, 55
volcanic areas and, 69
Hydrocarbon fluids
as source of primary carbon, 54
Hydrocarbon pollution
ethanol fuels and, 156-57
Hydrocarbons
abundance in solar system, 56-58
ascent through Earth's crust, 63-65
stability at depth in Earth, 58-60
thermal instability of, 58
transport by methane, 60
use as chemical feedstock, 174
Hydrochloric acid
radioisotope decontamination and, 271
Hydrofluoric acid
radioisotope decontamination and, 271
Hydrogen
amorphous silicon and, 2-3
Hydropower, 680

I

IEA/ORAU, 626-28, 671-74
IMPACT, 621
Import tariffs
energy policy and, 129
India
cooking device efficiency in, 117
cooking fuels used in, 114-18
electricity use in, 121-22
energy use in, 112
fuelwood consumption in, 411
kerosene use in, 421
natural gas production in, 465-66
natural gas reserves in, 464-65
natural gas self-sufficiency of, 472
Indian Point-1 nuclear power plant, 251
Indirect gain solar systems, 202
Indonesia
natural gas exports of, 475, 483
natural gas production in, 465-66
natural gas production/consumption in, 466-67
natural gas reserves in, 464-65
natural gas trade partnerships of, 467-68
Industrial countries
energy productivity improvement in, 645-56
Industrial fuel use, 165-98
chemical industry and, 183-89

direct process heat and, 171-73
electrolysis and, 174
future trends in, 194-98
machine drive and, 173
material feedstocks and, 174
mix of, 175-78
mobile engines and, 173-74
patterns of, 167-78
petroleum and coal products industry and, 189-93
process steam and, 174
pulp and paper industry and, 180-83
space conditioning and lighting and, 171
Industrial organic chemicals production of
fuel consumption in, 186-87
Industrial output
industrial fuel use and, 167-68
Industrial Petroleum Reserve, 536
Industry
energy productivity improvement in, 653-56
Industry Degraded Core Rulemaking Program, 45
Inflation
excess capacity and, 320-21
expectations and, 321-22
measurement of, 328-31
oil price reductions and, 332-33
oil price shocks and, 325-28
petroleum prices and, 317-39
relative prices and, 319
Institute for Nuclear Power Operations (INPO), 45
Institute of Energy Economics, 482
Insulation
passive solar buildings and, 213
residential energy use and, 361
Intense Neutron Source (INS), 86
International Atomic Energy Agency (IAEA), 80, 84, 98-100, 512
International Energy Agency (IEA), 80, 86, 98-100, 526, 528, 585, 594-600
International Energy Finance Corporation, 601
International Fusion Research Council, 98
International Institute for Applied Systems Analysis (IIASA), 621-25, 668, 674-76
International law
nuclear power plants and, 507-8
International Telecommunications Satellite Organization (INTELSAT), 104-5
International Tokamak Reactor (INTOR), 80, 88, 93, 98
Intrinsically safe fusion reactors, 459
Iran
natural gas reserves in, 464
nuclear power plants in, 502-3
oil fields of, 67-68
Iraq
nuclear power plants in, 502-3
oil fields of, 67-68
Ireland
energy research and development expenditures in, 600
energy reserve programs of, 528
Isolated gain solar systems, 202
Isoprenoids
presence in petroleum, 61
Isotope fractionation, 73-75
gas and petroleum migration through crust and, 63
Israel
nuclear power plant siting in, 510
nuclear power plants in, 502-4
Italian Atomic Energy Commission, 631
Italy
degree-days in, 354
district heating in, 372
energy reserve programs of, 528
energy use per dwelling in, 382
international fusion research and, 85, 105
natural gas consumption in, 398
oil stock consumption ratios for, 526-28
petroleum stockpiling in, 549-50
residential energy use in, 392
Ivory Coast
petroleum exploration in, 221
contractual agreements governing, 230
petroleum resource base of, 222-23

J

Jamaica
petroleum exploration in, 221
contractual agreements governing, 230
petroleum resource base of, 223
Japan
air conditioning energy use in, 367, 398
appliance efficiencies in, 388
degree-days in, 354
electric appliance ownership growth in, 395
electricity use for lighting in, 367
energy research and development expenditures in, 600
energy reserve programs of, 528
energy use per dwelling in, 382
hot water energy consumption in, 365
International Energy Agency and, 598
international fusion research and, 82-102
natural gas imports of, 473-74, 478, 482-83, 485
natural gas production in, 465-66
natural gas production/consumption in, 466-67
natural gas reserves in, 464-65
natural gas trade partnerships of, 467-68
oil stock consumption ratios for, 526-28
petroleum stockpiling in, 547-49
pressurized water reactors in, 437
process inherent ultimately safe reactor and, 447
public oil stockpiling in, 526
residential energy use in, 392
secondary heat sources in, 358-59
space heating efficiencies in, 360
space heating intensities in, 359
volcanic rock of
gas and oil production from, 72
methane in, 69
Japan Atomic Energy Research Institute (JAERI), 82
Japanese National Oil Company, 548
Java, Indonesia
oil fields of, 68-69
reforestation in, 424

Joint European Torus (JET), 87, 91, 93, 102-5
Joint ventures
  petroleum exploration and, 229-30
Jupiter
  atmosphere of
    hydrocarbons in, 57

K

Kajang, Malaysia
  major transport mode in, 124-25
  transport energy use in, 127
Kansas
  oil and gas fields of
    helium occurrence in, 70
Kenya
  charcoal consumption in, 415
  charcoal-making in, 416
  cooking fuels used in, 115
  energy consumption in, 414
  fuelwood consumption in, 411-15
  petroleum exploration in, 221
    contractual agreements governing, 230
  petroleum resource base of, 223
Kerosene
  use as cooking fuel, 113-17
  use in less developed countries, 118, 421-22
Khuff formation
  natural gas production and, 475
Korean Electric Power Company, 476
Kraftwerk Union, 607
Kuala Lumpur, Malaysia
  cooking fuels used in, 114-16
  major transport mode in, 124-25
  transport energy use in, 127
Kuwait
  nuclear power and, 503

L

Labor productivity
  aggregate price levels and, 334-35
Large Coil Task (LCT), 89, 93, 102
Large Coil Test Facility, 86, 100
Latin America
  biomass energy resources in, 408
Lawrence Livermore National Laboratory, 459
Less developed countries
  automobile ownership in, 124-25
  charcoal use in, 407-25
  cities of
    energy use in, 109-32
  commercial/institutional energy use in, 127-29
  cooking in, 112-18
  electricity-intense activities in, 118-20
  energy productivity improvement in, 656-58
  energy use in transportation in, 123-27
  fuel economics in, 420-22
  fuelwood use in, 407-25
  future energy demand in, 662-67
  global strategy studies and, 634-35
  home energy use in, 111-23
  household energy consumption in, 120-22
  lighting in, 118
  petroleum exploration in, 217-48
    contractual agreements in, 228-31, 240
    determinants of, 225-37
    econometric analysis of, 238-46
    economic risks in, 227-28
    infrastructure considerations in, 226, 239-40
    patterns of, 220-25
    policy making in, 246-48
    political risk in, 235-37, 240
    taxation of, 231-34
  petroleum importation in, 217-18
  petroleum investment activity in, 231
  urban energy use in
    government policy and, 129-31
Liberia
  cooking fuels used in, 115
  fuelwood consumption in, 411
  petroleum exploration in, 221
    contractual agreements governing, 230
  petroleum resource base of, 223
Libya
  nuclear power and, 502-4
Lighting
  industrial fuels and, 171
  less developed countries and, 118
  residential energy use and, 367
Light water reactors (LWRs), 252-54, 606
  core melt probability in, 433
  safety of, 432, 435-36
  thermal inertia of, 432
Liquefied natural gas (LNG)
  chains terminating in Asia, 489-91
Liquefied petroleum gas (LPG)
  use as cooking fuel, 113-17
Liquid-metal-cooled fast breeder reactors, 456-58, 603
Los Alamos National Laboratory (LANL), 203, 210, 214
Loss-of-coolant accidents (LOCAs), 449
Low level waste (LLW), 277, 281
Low Level Waste Policy Act of 1980, 281
Luminescence
  amorphous silicon doping and, 8
Luxembourg
  energy reserve programs of, 528

M

Machine drive
  industrial fuels and, 173
Madagascar
  petroleum exploration in, 221
    contractual agreements governing, 230
  petroleum resource base of, 223
Magnetic fusion, 79-107
  international cooperation in, 83-107
  worldwide programs in, 81-83
Magnetic Fusion Energy Engineering Act of 1980, 80, 94
Magnetic fusion technology
  national security considerations in, 92
Malaysia
  deforestation in, 422
  major transport mode in, 124-25
  natural gas exports of, 475-76, 483-84
  natural gas production in, 465-66
  natural gas production/consumption in, 466-67
  natural gas reserves in, 464-65
  natural gas trade partnerships of, 467-68
  petroleum exploration in, 220-22

contractual agreements governing, 230
taxation of, 232, 234
petroleum resource base of, 222-24
transport energy use in, 127
urban homes with refrigerators in, 118
Manila, Philippines
commercial/institutional energy use in, 128
cooking fuels used in, 114-115
demand for modern fuels in, 122
major transport mode in, 125
Manufacturing
electricity demand in, 176
industrial energy use and, 641
industrial fuels and, 166
mobile engines in, 173
Marathon Oil, 473
Markov transition matrix
oil market and, 534
Material feedstocks
industrial fuels and, 174
Mauritania
deforestation in, 422
petroleum exploration in, 221
contractual agreements governing, 230
petroleum resource base of, 223
Mechanical drive technology
energy productivity improvement and, 656
MEDEE-2, 621
Membrane separation technology
process innovation and, 654
Mercury
abundance in oil and gas regions, 70
Mercury vapor
amorphous silicon alloy formation and, 11
MESSAGE, 621
Metal-insulator-semiconductor solar cells, 12-14
Metallurgical coal
industrial use of, 177-78
Metallurgy
process innovation and, 654
Metamorphic rock
gas and oil production from, 72
Meteorites
carbon in, 57
molecular fossils in, 61
Methane
abundance in solar system, 57
ammonia production and, 185
amorphous silicon alloy formation and, 10
geographic distribution of, 69-70
granitic rock and, 60
liquid behavior of, 60
primary carbon and, 54
thermal stability of, 58
vertical columns of carbon isotopes in, 73
see also Natural gas
Mexico City, Mexico
energy demand per household in, 110
transport energy use in, 127
transportation energy efficiency in, 126
Michigan
Residential Conservation Service evaluation in, 308-11
Microwaves
localized heating and, 654
Middle East
nuclear power plants in, 502-4
oil fields of, 67-68
oil reserves in, 613
Mineral acids
radioisotope decontamination and, 271
Mining
industrial energy use and, 641
mobile engines in, 173
MITEL, 629-30, 671-73
Mitsubishi, 437, 474-79
Mitsui, 474-79
Mobile engines
industrial fuels and, 173-74
Mobil Oil, 476
Modular Retrofit Experiment (MRE), 647
Molecular fossils, 61-62
Molten salt breeder, 458-59
Molten Salt Reactor Experiment, 459
Molten salt reactors (MSRs), 458-59
Monrovia, Liberia
cooking fuels used in, 115
Montana
oil and gas fields of
helium occurrence in, 70
Morocco
petroleum exploration in, 221
contractual agreements governing, 230
petroleum resource base of, 223
Movable insulation
passive solar buildings and, 213
Mozambique
petroleum exploration in, 221
contractual agreements governing, 230
petroleum resource base of, 223
Multifamily dwellings, 343
heating intensities in, 385
space heating in, 351-55

N

Nairobi
cooking fuels used in, 115-16
energy demand per household in, 110
major transport mode in, 124-25
transport energy use in, 127
transportation energy efficiency in, 126
NASA Lewis Research Center, 651
National Academy of Sciences, 424, 630
National Energy Conservation Policy Act of 1977, 286-88, 585
National Gas Policy Act of 1978, 586
National Petroleum Council, 522, 534
National Research Council, 81, 93
National Science Foundation, 80, 567
National security
strategic petroleum reserves and, 517-19
National Solar Data Network (NSDN), 209
Natural gas, 53-75
agricultural chemical production and, 187
ammonia production and, 185
carbon isotope ratio and, 63
chemical feedstocks and, 174
commercial production of Asian, 465-66
direct process heat and, 172
domestic consumption of Asian, 466-67
geographic distribution of, 67-70
industrial consumption of, 166
industrial organic chemical production and, 187
industrial space heating and, 171
international trade in, 467-70
preembargo United States energy policy and, 561
prices of
regulation of, 570-71
production from high-pressure domains, 67

pulp and paper industry and, 181
reservoirs of
chemical prospecting for, 64
residential consumption of, 397-98
supply and demand in Asia, 463-88
worldwide reserves of, 464-65
see also Methane
Natural Gas Policy Act of 1978, 571
Nepal
deforestation and, 423
fuelwood consumption in, 411
Neptune
atmosphere of
hydrocarbons in, 57
Netherlands
energy reserve programs of, 528
fuel shares in, 373
natural gas consumption in, 398
residential energy use in, 392
New Guinea
oil fields of, 68
New Mexico
oil and gas fields of
helium occurrence in, 70
New York State
1977 Home Insulation and Energy Conservation Act of, 291
New Zealand
energy research and development expenditures in, 600
energy reserve programs of, 528
natural gas production in, 465-66
natural gas reserves in, 464-65
natural gas self-sufficiency of, 470-71
Next European Torus (NET), 82-83
Nicaragua
petroleum exploration in, 221
contractual agreements governing, 230
petroleum resource base of, 223
Nigeria
fuelwood consumption in, 411
Nissho-Iwai, 480
Noble gases
concentrations in petroliferous areas, 69-70
North Africa
oil reserves in, 613
North America
deforestation in, 422
district heating in, 355, 372
electric appliance ownership growth in, 395
energy use per dwelling in, 382
forest resources in, 409
fuel shares in, 372-73
heating equipment saturation in, 394
hot water energy consumption in, 364-65
North Atlantic Treaty Organization (NATO), 504-6
Norway
degree-days in, 354
electric heating in, 398
energy reserve programs of, 528
energy use per dwelling in, 382
fuel shares in, 372-73
housing stock turnover in, 394
insulation in, 361
natural gas consumption in, 397
residential energy use in, 392
secondary heat sources in, 358-59
space heating fuel choices in, 357
wood consumption in, 358, 399
Nuclear energy
international management of, 511-12
preembargo United States energy policy and, 562-63
Nuclear power plants
actively safe, 432-34, 434-45
decommissioning of, 251-83
approaches to, 253-54
cost estimates in, 260-65, 279-80
criteria for, 255-60
current activities in, 266-77
decontamination in, 270-74
dismantling in, 274-75
financial issues in, 279
method of, 281
personnel exposure in, 280-81
reasons for, 251
regulatory constraints in, 277
remote systems in, 275-77
waste disposal and, 281-82
design and operation of, 36-39
increasing safety of, 511
inherently safe, 431-61
military sabotage of, 495-512
passively safe, 432-34, 445-54
safety of, 37-38
strategic implications and, 501-2
strategic siting of, 510
vulnerability of, 496-501
Nuclear reactors
advanced pressurized water, 437-40
boiling water, 252, 261, 266, 267, 435, 440-41, 443, 440-41
CANDU-pressurized heavy water, 441-43
fast, 603-9
high-temperature gas-cooled, 443-45
modular, 450-54
intrinsically safe fusion, 459
light water, 252-54, 432, 435-36, 606
liquid-metal-cooled fast, 456-58, 603
molten salt, 458-59
pressurized water, 261-65, 432-40
process inherent ultimately safe, 445-50
Schultz-Edlung steam-cooled fast, 454-56
Nuclear Regulatory Commission, 35, 252-57, 277-78, 434, 435, 443, 497, 567
Three Mile Island Unit 2 and, 42-46
Nuclear war
global energy strategy and, 617-18
Nuclear weapons
global energy strategy and, 618-19
nuclear energy and, 678-80

O

Oak Ridge National Laboratory (ORNL), 501
Residential Conservation Service and, 306-8
Oak Ridge Reactor (ORR), 87
ODEX, 275
Office of Science and Technology Policy, 608
Oil
see Petroleum
Oil shocks
consumer prices and, 331-32
effects of, 515-16
historical, 323-24
inflation and, 325-28
policy and, 516-19
Operations Risk Index, 240
Optical absorption coefficients
amorphous silicon and, 5
semiconductors and, 3

Organization of Arab Petroleum Exporting Countries (OAPEC), 531, 557, 563
Organization for Economic Cooperation and Development (OECD), 341, 343, 359, 363, 398, 516, 526-27, 544, 590, 595-97, 626-28, 650, 661-62, 683
Organization of Petroleum Exporting Countries (OPEC), 80, 219, 241-42, 321, 338, 472, 531-32, 542-44, 558, 570-73, 615
Organometallic compounds
transport by methane, 60
Osaka Gas, 474
Otto cycle engines
ethanol use in, 154-55
Ouagadougou, Upper Volta
cooking fuels used in, 115
Oxidation
stability of hydrocarbons against, 58-59

P

Pacific Gas and Electric Company, 571
Pacific Northwest Electric Power and Planning Conservation Act of 1980, 586
Pakistan
natural gas production in, 465-66
natural gas production/consumption in, 466-67
natural gas reserves in, 464-65
natural gas self-sufficiency of, 471-72
nuclear power plant siting in, 510
petroleum exploration in, 220-21
contractual agreements governing, 230
petroleum resource base of, 223
Pan-Albert Gas, 480
Panama
petroleum exploration in, 221
contractual agreements governing, 230
petroleum resource base of, 223
Papua New Guinea
commercial/institutional energy use in, 128
electricity use in, 121
energy policy in, 130
major transport mode in, 124
patterns of energy use in, 111-12
petroleum exploration in, 220-21
contractual agreements governing, 230
taxation of, 232, 234
petroleum fuel consumption in, 110
petroleum resource base of, 223
Paraguay
petroleum exploration in, 221
contractual agreements governing, 230
petroleum resource base of, 223
Passive cooling systems, 210-11
Passive solar buildings, 201-15
air infiltration testing in, 212
auxiliary heating in, 214
design considerations in, 211-14
design parameters for, 202-3
double-envelope, 209-10
National Solar Data Network and, 209
operable components in, 212-14
thermal performance of, 203-9
Passive solar systems
conservation vs, 211-12
direct gain, 202
indirect gain, 202
isolated gain, 202
types of, 202
Peach Bottom boiling water reactor
core melt probability of, 435
People's Republic of China
charcoal use in, 419-20
cooking device efficiency in, 117
international fusion research and, 84
natural gas exports of, 480, 484
natural gas production in, 465-66
natural gas production/consumption in, 466-67
natural gas reserves in, 464-65
natural gas self-sufficiency of, 471
oil fields of, 69
per capita gross domestic product growth in, 666
urban homes with refrigerators in, 118
Persian Gulf States
oil fields of, 67-68
Peru
petroleum exploration in, 220-22
contractual agreements governing, 230
taxation of, 232
petroleum resource base of, 223
Petro-Canada, 480
Petroleum, 53-75
biogenic origins of, 55-56
biological contamination of, 61-62
biological markers in, 61-62
carbon isotope ratio and, 62-63
chemical feedstocks and, 174
chemical industry and, 186
consumption in Papua New Guinea, 110
direct process heat and, 172
geographic distribution of, 67-70
importation in less developed countries, 217-18
industrial consumption of, 166
preembargo United States energy policy and, 560-61
prices of
inflation and, 317-39
private stockpiles and, 537-38
public stockpiles and, 539-40
regulation of, 570
strategic petroleum reserve and, 542-45
production of
fuel consumption in, 189-93
pulp and paper industry and, 181
refining of
fuel consumption in, 189-93
reservoirs of
chemical prospecting for, 64
thermal instability of, 58
Petroleum drilling
mobile engines in, 173
Petroleum exploration in less developed countries, 217-48
contractual agreements in, 228-31
econometric analysis of, 240
costs of
field size and, 226
determinants of, 225-37
econometric analysis of, 238-46
economic risks in, 227-28
geologic factors in, 225-26
econometric analysis of, 239

infrastructure in, 226
econometric analysis of, 239-40
pattern of, 220-25
policy making and, 246-48
political risk in, 235-37
econometric analysis of, 240
taxation of, 231-34
Petroleum Reserves and Import Policy Act, 522
Philippines
commercial/institutional energy use in, 128
cooking fuels used in, 115-16
deforestation in, 422
demand for modern fuels in, 122
energy policy in, 129
fuelwood consumption in, 413
major transport mode in, 125
petroleum exploration in contractual agreements governing, 230
petroleum resource base of, 222-23
urban homes with refrigerators in, 118
Phillips curve, 320-22
Phillips Petroleum, 473
Phosphine
amorphous silicon doping and, 8
amorphous silicon:hydrogen optical absorption and, 6
Photochemical vapor deposition
amorphous silicon alloy deposition and, 8, 11
Photovoltaic cells
see Amorphous silicon solar cells
Photovoltaic technology
see Amorphous silicon solar cell technology
p-i-n solar cells, 14-15
current-voltage characteristics of, 20-21
Plasma metallurgy
process innovation and, 654
Plasma physics, 81, 84, 89
Plasmamelt, 654
Political risk
petroleum exploration in less developed countries and, 235-37
Pollution
ethanol fuels and, 156-57
Pondicherry, India
total energy use in, 112
Population
energy demand and, 627
Population growth
global energy strategy and, 617
Porphyrins
presence in petroleum, 61
Portugal
energy research and development expenditures in, 600
energy reserve programs of, 528
Poverty
energy and, 638-39
global energy strategy and, 617
Powder metallurgy
process innovation and, 654
Power Plant and Industrial Fuel Use Act of 1978, 586
Pressurized water reactors, 261, 432
core melt probability of, 435
dismantlement cost estimates for, 263-65
safety improvements in, 436-40
Primary energy, 347
Probability risk assessment (PRA)
high-temperature gas-cooled reactor and, 444
nuclear power plant safety and, 433
Process heat
electricity consumption in, 176-77
Process inherent ultimately safe reactor, 445-50
schematic diagram of, 446
Process innovation
energy productivity improvement and, 654-55
Process steam
industrial fuels and, 174
Product design
energy productivity improvement and, 655-56
Production-sharing contracts
petroleum exploration and, 229
Profit taxes
petroleum exploration and, 231-32
Project Independence, 523
Public Citizen, 255
Public Utilities Regulatory Policies Act of 1978, 571, 586
Pulp and paper industry
fuel use in, 180-83

Q

Qatar
natural gas exports of, 478
Qatar General Petroleum Corporation, 478

R

Radiatively active trace substances (RATS), 619
Radioactivity
atmospheric emissions of medical effects of, 500
Radioisotopes
decontamination of, 270-74
RAND Corporation, 311
Red Sea
rift of
methane in, 69
Refrigeration
in less developed countries, 118-20
Residential buildings
energy productivity improvement in, 645-49
Residential Conservation Service (RCS), 285-313
audit calculations and, 302-3
audits and program costs of, 292-93
consumer protection and, 300-2
costs of, 295-96
energy savings and, 296-97
evaluation of, 304-11
history of, 286-90
implementation in California, 297-304
market for, 303-4
national results of, 290-97
participants in, 295
Residential Energy Consumption Survey, 345
Residential energy use
international, 341-402
in 1982, 350-76
bottom-up approach to, 342-50
changes in since 1973, 376-94
economic and demographic determinants in, 370-72
fuel shares and, 372-74
Resource rent
petroleum exploration and, 232-33
Rheinisch-Westfalisches Elektrizitaetswerk, 607
Risk service contracts
petroleum exploration and, 229
Robotics
nuclear power plant decommissioning and, 275-77

Rockwell International, 456-57, 457
Roof ponds
  passive cooling and, 211
ROSA, 275
Rotating Target Neutron Source (RTNS), 87
ROVER, 275
Royalties
  petroleum exploration and, 231-32

S

SAFSTOR, 253-55, 262, 267
Sakhalin gas development project, 478
Sanyo solar cell
  collection efficiency for, 24
Sao Paulo, Brazil
  ethanol production in, 139-40
Saturn
  atmosphere of
    hydrocarbons in, 57
Saudi Arabia
  oil fields of, 67-68
Scabbing
  radioisotope decontamination and, 273
Scandinavia
  electric appliance ownership growth in, 395
  heating equipment saturation in, 394
  hot water energy consumption in, 365
  residential wood use in, 346
Schottky barrier solar cells, 12, 14
Schultz-Edlung steam-cooled fast reactor, 454-56
Secure-P reactor, 445-50
Sedimentary basins
  oil and gas exploration in, 72
Semiconductors
  optical absorption coefficient of, 3
  see also Amorphous semiconductors
Senegal
  charcoal-making in, 416
  petroleum exploration in, 220-21
    contractual agreements governing, 230
  petroleum resource base of, 223
Sequoyah nuclear power plant
  radioisotope decontamination at, 273
Service contracts
  petroleum exploration and, 229
Shell Oil Company, 473-74, 477, 482
  political risk assessment procedures of, 236-37
Shippingport nuclear power plant, 251
  decommissioning of, 268-69
Signature bonuses
  petroleum exploration and, 231
Silane
  amorphous silicon alloy formation and, 9, 11
Silicon solar cells
  see Amorphous silicon solar cells
Siljan Ring
  petroliferous areas of, 72
Singapore
  energy policy in, 131
  natural gas imports of, 476-77, 483-85
  per capita gross domestic product growth in, 666
Singapore National Oil Corporation, 476
Single-family dwellings
  energy used for space heating in, 351-55
  heating intensities in, 385-87
Sizewell-B pressurized water reactor, 437
  probability risk assessment for, 438
Socioeconomic class
  household energy consumption and, 120-22
  transportation energy use and, 126-27
Solar cells
  photogenerated carrier transport in, 6-8
  see also specific type
Solar Energy Research Institute (SERI), 209
  passive solar building programs of, 203-4
Solar-load ratio (SLR), 203, 210, 214
Solar savings fraction (SSF), 203
Solar system
  hydrocarbon abundance in, 56-58
Somalia
  petroleum exploration in, 221
    contractual agreements governing, 230
  petroleum resource base of, 223
South Africa
  nuclear power plant siting in, 510
South America
  deforestation in, 407
  forest resources in, 409
  vanadium-rich oils of, 70
Southeast Asia
  deforestation in, 422
Southern Solar Energy Center, 209
South Korea
  energy policy in, 131
  natural gas imports of, 476-78, 483-85
  per capita gross domestic product growth in, 666
  petroleum exploration in, 221
    contractual agreements governing, 230
  petroleum resource base of, 223
Soviet Union
  forest resources in, 409
  international fusion research and, 83, 88, 90-95, 98
  natural gas exports of, 478
  natural gas imports of, 474, 485
  natural gas reserves in, 464
  natural gas trade partnerships of, 467-68
  nuclear power in
    strategic implications of, 504-6
  nuclear power plant siting in, 510
Space conditioning
  industrial fuels and, 171
Space heating
  efficiencies in, 360-64
  electric
    demand for, 398
  energy productivity improvement in, 645-50
  energy used by fuel, 355-59
  residential energy use and, 350-64
Spain
  energy reserve programs of, 528
Sputtering
  amorphous silicon alloy deposition and, 8
Stacked junction solar cells, 15-17
Standard Industrial Classification product categories, 168-70, 178-93
Steam
  ethylene production and, 186
Steel industry
  electricity consumption in, 176
  energy consumption in, 654
  fuel switching in, 172-73

Strategic petroleum reserves, 515-54
drawdown of, 536-45
financing of, 535-36
international coordination of, 528-30
management considerations in, 519-20
oil supply disruptions and, 515-16
policy and, 516-19
private stockpiling of, 520-22
public stockpiling of, 522-28
sizing of, 533-35
Sudan
deforestation in, 422
fuelwood consumption in, 411-13
Sumatra
oil fields of, 68-69
Suncor, 480
Sunlight
photoelectric conversion into electricity, 1
Super-cement, 655-56
Super-Phenix project, 94, 106
Surinam
petroleum exploration in, 221
contractual agreements governing, 230
petroleum resource base of, 223
Surry pressurized water reactor
core melt probability of, 435
Sweden
appliance efficiencies in, 388
cooking fuel choices in, 366
degree-days in, 354
district heating in, 355, 372
ELAK code in, 395
electric heating in, 398
electricity use for lighting in, 367
employment in, 640
energy productivity improvement in, 645-47
energy reserve programs of, 528
energy use per dwelling in, 382, 387
heat demand in, 351
hot water energy consumption in, 364-65
house vintage in, 361
housing stock turnover in, 394
industrial output in, 541
insulation in, 361
natural gas consumption in, 397
nuclear power civil defense in, 509
oil-heating stock consumption in, 361-63
petroliferous areas of, 72
process inherent ultimately safe reactor and, 447
secondary fuels in, 358
small appliances in, 366
space heating efficiencies in, 360
space heating fuel choices in, 357
steel making in, 654
useful energy consumption in, 387
wood consumption in, 346, 358, 399
Switzerland
energy reserve programs of, 528
international fusion research and, 85-86
nuclear power civil defense in, 509
Synthetic Fuels Corporation, 565
Syria
nuclear power and, 503

T

Taiwan
demand for modern fuels in, 123
natural gas imports of, 478, 485
natural gas production in, 465-66
natural gas reserves in, 464-65
petroleum exploration in, 221-22
contractual agreements governing, 230
petroleum resource base of, 223
Tanzania
deforestation and, 423
fuelwood consumption in, 411-13
Taxation
petroleum exploration and, 231-34
Tax credits
residential energy conservation and, 287
Tennessee Valley Authority, 291, 449, 561
Tetramethyltin
amorphous silicon alloy formation and, 10
Texas Railroad Commission, 558-60
TEXTOR tokamak, 86
Thailand
fuelwood consumption in, 411
gas field development in, 479
foreign investment in, 226
natural gas production in, 465-66
natural gas reserves in, 464-65
per capita gross domestic product growth in, 666
petroleum exploration in, 221-22
contractual agreements governing, 230
petroleum resource base of, 224
Thermal storage
rockbeds and, 210
Third World
see Less developed countries
Thorium
radioactive decay of
helium formation and, 69
Three Mile Island Unit 2, 35-51, 251, 435
accident at, 39-42
damaged core of, 47
following core recovery, 49
Nuclear Regulatory Commission and, 42-46
postaccident examination of, 46-50
radioisotope decontamination at, 273
Titan
atmosphere of
hydrocarbons in, 57
Tobago
petroleum exploration in, 222
contractual agreements governing, 230
petroleum resource base of, 224
Todd Oil Services, 473
Togo
petroleum exploration in, 221
contractual agreements governing, 230
petroleum resource base of, 224
Tokamak confinement concept, 79-80
Tokamak Fusion Test Reactor (TFTR), 82-83, 102
Tokyo Electric, 474, 482
Tokyo Gas, 474, 482
Toshiba, 440
Trace elements
concentrations in petroliferous areas, 69-70
geographic distribution of, 67-70
transport by methane, 60
Trade Agreements Extension Act of 1955, 522
Trans Alaska Pipeline Act of 1973, 585
Trans-Canada Pipelines, 480

Transportation
energy productivity improvement in, 650-53
in less developed countries, 123-27
Trinidad
petroleum exploration in, 222
contractual agreements governing, 230
petroleum resource base of, 224
Tritium Systems Test Facility (TSTA), 87
Trojan nuclear power plant, 261
Trombe wall, 202, 213
Trucks
fuel economy of
improvement in, 650-53
Tunisia
petroleum exploration in, 220-22
contractual agreements governing, 230
petroleum resource base of, 222, 224
Turkey
energy research and development expenditures in, 600
energy reserve programs of, 528
petroleum exploration in, 222
contractual agreements governing, 230
petroleum resource base of, 224
Twin Rivers Project, 371

U

Ultraviolet light
amorphous silicon alloy formation and, 11
Unemployment
aggregate price levels and, 334-35
inflation and, 320-21
oil price reductions and, 332-33
UNESCO, 100
Union Oil, 480
United Kingdom
degree-days in, 354
electric appliance ownership growth in, 395
electric heating in, 398
energy reserve programs of, 528
energy use per dwelling in, 382
hot water energy consumption in, 365
international fusion research and, 85
natural gas consumption in, 397
oil stock consumption ratios for, 526-28
pressurized water reactors and, 437
residential energy use in, 392
space heating intensities in, 359
United Kingdom Atomic Energy Authority, 437
United Nations Food and Agricultural Organization, 407
United States
air conditioning energy use in, 367
air conditioning penetration in, 398
appliance efficiencies in, 388
capital expenditures on energy in, 614
cooking fuel choices in, 366
deforestation in, 407-8
degree-days in, 354
electric heating in, 398
electricity use for lighting in, 367
employment in, 640
energy conservation in, 575-80
energy policy in, 557-84
energy productivity improvement in, 645-47
energy research and development in, 580-83
expenditures for, 600
international cooperation and, 600-3
energy reserve programs of, 528
energy use per dwelling in, 387
fuel shares in, 372-73
house vintage in, 361
housing stock turnover in, 394
insulation in, 361
international fusion research and, 82-105
natural gas consumption in, 397
natural gas exports of, 473-74
natural gas reserves in, 464
natural gas trade partnerships of, 467-68
nuclear power plant decommissioning in, 252-53
nuclear reactor cancellations in, 431
oil-heated dwellings in, 355
oil stock consumption in, 363
ratios for, 526-28
per capita gross domestic product growth in, 666
photovoltaic technology in, 29-30
public oil stockpiling in, 522-26
residential wood use in, 346
secondary fuels in, 358
small appliances in, 366
space heating fuel choices in, 357
stagflation in, 323-24
steel making in, 654
wood consumption in, 358, 399
United States Department of Energy (DOE), 275, 289-313, 523, 563, 567-68, 578, 581, 602-3, 607, 615, 626
Residential Conservation Service and, 305-6
United States Department of Housing and Urban Development, 578
United States Department of Transportation, 576
Upper Volta
cooking fuels used in, 115
Uranium
radioactive decay of
helium formation and, 69
Uranium dioxide
melting temperature of, 48
nuclear energy production and, 37
Uranus
atmosphere of
hydrocarbons in, 57
Urbanization
energy demand and, 639
in less developed countries, 109-10
patterns of energy use and, 110-11
Useful energy, 347
USSR
see Soviet Union
Utah
oil and gas fields of
helium occurrence in, 70
Utility Decommissioning Group (UDG), 255

V

Vanadium
presence in oil, 70
Vereinigung Deutscher Elektrizitatswerke, 345
Versailles Summit Process, 85, 97-99, 104
Volcanic areas
hydrocarbon deposits and, 69

Volcanic rock
  gas and oil production from, 72
Volkswagen Experimental Car 2000, 651
Volvo Light Component Project 2000, 651, 655

W

Washington Public Power System, 261
Water heating
  residential energy use and, 364-65
Westcoast Transmission Co., 480
West Germany
  see Federal Republic of Germany
Westinghouse, 275, 437-39, 456-57
West Texas
  oil and gas fields of helium occurrence in, 70
Wood
  residential energy use and, 399
Wood fuels
  demand for, 408
  quantifying, 409-10
  supply of, 408
  see also Fuelwoods
Woodside Petroleum, 477
World Bank, 424, 472, 615
  petroleum exploration in less developed countries and, 219
World Energy Conference (WEC), 625-26, 668, 674-76
World Health Organization (WHO), 412
World oil market
  modeling of, 530-33
Wyoming
  oil and gas fields of helium occurrence in, 70

Y

Yugoslavia
  per capita gross domestic product growth in, 666

Z

Zaire
  petroleum exploration in, 222
    contractual agreements governing, 230
Zircaloy
  use in nuclear reactors, 37